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Gregory P. LaPointe
BACHMAN & LaPOINTE, P.C.
Suite 1201
900 Chapel Street
New Haven, CT 06510-2802

EXAMINER	
LEE, SHUN K	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/056,437	Applicant(s) CHO ET AL.	
	Examiner Shun Lee	Art Unit 2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *1/23/2002, 9/9/2004, & 3/2/2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 26 December 2006 has been entered.

Information Disclosure Statement

2. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. The specification discloses (pg. 20, lines 6-16) that "Once carriers are released from the quantum dot layer by absorbing photons, the carriers with electric charges (i.e., negative for electron) move spatially to the channel layer (conduction path layer) and the resulting vacancy in the quantum dot causes electric potential changes around the quantum dot region including the channel region. This is also the very reason why the quantum dots are placed near the channel in the present invention. The term "near the channel" means a distance wherein the quantum dots influence the potential of the channel by accumulating carriers in the channel layer". Thus within the context of the specification, the claim limitations "predetermined positions near" and "located near" is a distance that the photogenerated carriers <u>can transit so as to accumulate in the channel</u> (and there is an

electric potential change in the channel due to the electric potential of the accumulated photogenerated carriers and the electric potential of the quantum dot vacancies).

7. Claims 1-3, 5-10, 13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iafrate *et al.* (US 4,821,093) in view of Romero *et al.* ("An analytical model for the photodetection mechanisms in high-electron mobility transistors", *IEEE Transactions on Microwave Theory and Techniques*, Vol. 44, no. 12, (December 1996), pp. 2279-2287) and Esaki *et al.* (US 5,079,601).

In regard to claims **1** and **2**, Iafrate *et al.* disclose a materialization method of a photo detect device, wherein channels for transferring carriers are set by heterointerfaces and impurity doping and magnitude of currents which flow through the channels is determined by controlling Fermi level (see gate electrode 28 in Fig. 1 and column 1, lines 18-49), comprising the steps of:

(a) forming at least one absorption layer at predetermined position proximate to the channels so as to influence the potential of the channels in such a manner that the for carriers in the at least one absorption layer to be released in response to incident light and accumulated in the channels, wherein a photon absorption facilitates the current flow through the channel (column 7, lines 37-51); and

(b) providing the Fermi level at an activation position by confining the carriers within the at least one absorption layer while limiting the number of the carriers in the channels for the purpose of minimizing a current flow in the absence of incident light (column 7, lines 37-51).

The HEMT photodector of Iafrate *et al.* lacks an explicit description that carriers in a contact layer are drawn to the channels until the vacancy of the at least one absorption layer, which is originated by the release of carriers, is refilled by other carriers. However, the photodectection mechanisms of HEMT photodetectors are known in the art. For example, Romero *et al.* teach (last paragraph in the left column on pg. 2280; Fig. 2) that charge neutrality is reestablished by electrons drawn from the external circuit through the source contact. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the photodectection mechanisms of the HEMT photodector of Iafrate *et al.* include carriers being drawn to the channels from the contact layer in order to reestablish charge neutrality (*i.e.*, the vacancy of the at least one absorption layer, which is originated by the release of carriers, is refilled by other carriers).

The method of Iafrate *et al.* also lacks that the at least one light absorption layer comprise of at least one quantum dot layer which includes a plurality of quantum dots for infrared (*i.e.*, wavelength from 0.77 μm to 100 μm) light detection. Esaki *et al.* teach to provide an absorption layer comprising of nanostructures which produce reduced dimensionality electronic states (*e.g.*, quantum wells, quantum wires, quantum dots; column 8, lines 24-30) in order to have optical transition occurring between electron states in the conduction band (or hole states in the valence band; column 2, lines 35-39) so as to absorb light from the near to the far infrared (column 2, lines 26-29). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide at least one light absorption layer comprising of quantum dots in the

method of Iafrate *et al.*, in order to detect light from the near (*e.g.*, 0.77 μm) to the far infrared (*e.g.*, 100 μm) as taught by Esaki *et al.*

In regard to claim **3**, Iafrate *et al.* disclose (Fig. 1) a photo detect device, wherein channels for transferring carriers are set by heterointerfaces and impurity doping, comprising:

(a) at least one light absorption layer (12) located at predetermined positions proximate to the channels in at least one conduction path layer (30) for the carriers in the at least one light absorption layer (12) to be released in response to incident light and accumulated in the channels (column 7, lines 37-51);

(b) the at least one conduction path layer (30), in which carriers excited in the light absorption layers (12) are collected and conducted in a horizontal direction which is parallel to the at least one conduction path layer (30);

(c) at least two detect electrodes (24, 26) for conducting in the horizontal direction the carriers which are accumulated in the channels (30) in response to the light incident on the at least one light absorption layer (12), the two electrodes are formed at respective end portions of the at least one light absorption layer (12), wherein a photon absorption facilitates the current flow through the channel (column 7, lines 37-51); and

(d) a contact layer (22) on which the detect electrodes (24, 26) are formed to collect and to provide the carriers for the at least one light absorption layer (12).

The HEMT photodector of Iafrate *et al.* lacks an explicit description that carriers are drawn to the channels from the contact layer due to the potential of the channels which

are influenced by the carriers accumulating in the channels. However, the photodectection mechanisms of HEMT photodetectors are known in the art. For example, Romero *et al.* teach (last paragraph in the left column on pg. 2280; Fig. 2) that charge neutrality is reestablished by electrons drawn from the external circuit through the source contact. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the photodectection mechanisms of the HEMT photodector of Iafrate *et al.* include carriers being drawn to the channels from the contact layer due to the potential of the channels which are influenced by the carriers accumulating in the channels in order to reestablish charge neutrality.

The device of Iafrate *et al.* also lacks that the at least one light absorption layer comprise of at least one quantum dot layer containing a plurality of quantum dots for releasing carriers in response to the incident light, which is formed by alternating the quantum dot layer and a material different in bandgap from the quantum dot layer. Esaki *et al.* teach a light absorption layer comprising of nanostructures which produce reduced dimensionality electronic states (*e.g.*, quantum wells, quantum wires, quantum dots; column 8, lines 24-30) in order to have optical transition occurring between electron states in the conduction band (or hole states in the valence band; column 2, lines 35-39) so as to absorb light from the near to the far infrared (column 2, lines 26-29). That is, Esaki *et al.* teach that a photon (with energy $\hbar\omega$) is absorbed in the conduction band of a light absorption layer when an electron in an electron state with energy E_1 makes an optical transition to an unoccupied electron state with energy E_2 ($E_2 = E_1 + \hbar\omega$). Esaki *et al.* also teach that electron state with energy E_1 must be

populated with electrons in order for the optical transition to occur (*i.e.*, arrangement of the band and Fermi levels, for example by applying a bias voltage, so that electrons move from another layer into the electron state with energy E_1 of the absorption layer; column 6, lines 59-63). Thus, Esaki *et al.* teach that the absorption layer with electron state with energy E_1 should be populated with electrons and electron state with energy E_2 should be unoccupied so that an optical transition can occurred in order to detect light from the near to the far infrared. Also, modulation doping (*i.e.*, carriers supplied to a layer by at least one impurity-containing layer) so as to provide carriers for the electron state with energy E_1 is well known in the art. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a light absorption layer comprising of quantum dots with carriers supplied by at least one impurity-containing layer in the device of lafrate *et al.*, in order to detect light from the near to the far infrared as taught by Esaki *et al.*

In regard to claim **5** which is dependent on claim 3, the device of lafrate *et al.* lacks at least one impurity-containing layer that is a delta-doped structure. Esaki *et al.* teach that the absorption layer with electron state with energy E_1 should be populated with electrons and electron state with energy E_2 should be unoccupied so that an optical transition can occurred in order to detect light from the near to the far infrared (see above). Inherent in Esaki *et al.*'s teachings is that enough electrons must be provided to the absorption layer in order to populate electron state with energy E_1 while leaving electron state with energy E_2 unoccupied. Thus, number of impurities in the impurity-containing layers is determined by the number of electrons needed to populate

electron state with energy E_1 while leaving electron state with energy E_2 unoccupied. Impurity-containing layers with a delta-doped structure are well known in the art. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide impurity-containing layers with a delta-doped structure in the device of lafrate *et al.*, in order to supply carriers from impurity-containing layers to the absorption layer so as to detect light from the near to the far infrared as taught by Esaki *et al.*

In regard to claim **6** which is dependent on claim 3, the device of lafrate *et al.* lacks at least one impurity-containing layer having a uniform distribution of the impurities therethrough and are etched to control the number of carriers provided to the quantum dots. Esaki *et al.* teach that the absorption layer with electron state with energy E_1 should be populated with electrons and electron state with energy E_2 should be unoccupied so that an optical transition can occurred in order to detect light from the near to the far infrared (see above). Inherent in Esaki *et al.*'s teachings is that enough electrons are provided to the absorption layer in order to populate electron state with energy E_1 while leaving electron state with energy E_2 unoccupied. Thus, number of impurities in the impurity-containing layers is determined by the number of electrons needed to populate electron state with energy E_1 while leaving electron state with energy E_2 unoccupied. The number of electrons supplied by impurity-containing layers is determined by the number of impurities. For a uniform distribution of the impurities, the number of impurities is equal to the density of impurities times the volume of the impurity-containing layers. Thus, the number of electrons supplied by

impurity-containing layers is determined by the density of impurities and the volume of the impurity-containing layers. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide impurity-containing layers with a uniform distribution of the impurities and an adjusted volume (*e.g.*, by etching) in the device of Iafrate *et al.*, in order to supply carriers from impurity-containing layers to the absorption layer so as to detect light from the near to the far infrared as taught by Esaki *et al.*

In regard to claims **7** and **8** which are dependent on claim 3, Iafrate *et al.* also disclose (Fig. 1) impurity-containing layers (14) and light absorption layers (12) formed adjacent (*e.g.*, overlapped) to conduction path layers (30).

In regard to claim **9** which is dependent on claim 3, Iafrate *et al.* also disclose that the impurity-containing layers and the light absorption layer are made to have different band gaps so as to be subjected to heterostructures (*i.e.*, heterojunction; column 1, lines 18-49). While Iafrate *et al.* further disclose that the conducting path layers is in the form of a two-dimensional electron gas (column 1, lines 18-49), the device of Iafrate *et al.* lacks an explicit description that the conducting path layers have a different band gap so as to be subjected to heterostructures. However it is well known in the art that two-dimensional electron gas occurs in a quantum well and that a quantum well is formed by band gap differences. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide conducting path layers made to a different band gaps in the device of Iafrate *et al.*, in order to form

a two-dimensional electron gas so as to have high electron mobility conducting paths as taught by Iafrate *et al.* (column 1, lines 18-49).

In regard to claim **10** which is dependent on claim 3, Iafrate *et al.* also disclose (Fig. 1) at least one control electrode (28) for controlling the amount of the carriers provided to the light absorption layers (12) and the conduction path layers (30).

In regard to claims **13** and **16** which are dependent on claim 10, Iafrate *et al.* also disclose a multiple gate high electron mobility field effect transistor in a photodetector configuration (see Figs. 2 and 8; and column 7, lines 37-51).

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iafrate *et al.* (US 4,821,093) in view of Romero *et al.* (*IEEE Trans. Microwave Theory Tech.*, Vol. 44, no. 12, (December 1996), pp. 2279-2287) and Esaki *et al.* (US 5,079,601) as applied to claim 3 above, and further in view of Bethea *et al.* (US 4,739,385).

In regard to claim **4** which is dependent on claim 3, the modified device of Iafrate *et al.* lacks an explicit description of the distance between the detect electrodes. Bethea *et al.* disclose that detect electrodes (15, 19 in Fig. 1) should have a distance therebetween which is greater than 2.5 μm to 120 μm (column 3, lines 7-9) in order to have good optical coupling efficiency (column 3, lines 13-16). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide greater than 2.5 μm to 120 μm distance (*e.g.*, which is longer than a 0.77 μm incident light wavelength) between the detect electrodes in the modified device of Iafrate *et al.*, in order to have good optical coupling efficiency as taught by Bethea *et al.*

9. Claims 11, 12, 14, 15, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iafrate *et al.* (US 4,821,093) in view of Romero *et al.* (*IEEE Trans. Microwave Theory Tech.*, Vol. 44, no. 12, (December 1996), pp. 2279-2287) and Esaki *et al.* (US 5,079,601) as applied to claims 10, 13, and 16 above, and further in view of Schiebel *et al.* (US 5,396,072).

In regard to claims **11** and **12** (which are dependent on claim 10), claims **14** and **15** (which are dependent on claim 13), and claims **17** and **18** (which are dependent on claim 16), the modified device of Iafrate *et al.* lacks a layer (*e.g.*, doped or highly resistant) provided below a bottom layer of the control electrodes to reduce leak currents of the control electrodes. The use of layers (*i.e.*, blocking layers) overlapping electrodes to block charge injection from the electrode (*i.e.*, leakage current) is well known in the art. For example, Schiebel *et al.* teach to provide a layer overlapping a electrode which is substantially not conductive to carriers of: (a) both polarities (column 3, lines 45-49) or (b) same polarity relative to the potential of electrode (column 3, lines 32-36). For example, for an electrode which will have both negative and positive voltages applied, a highly resistant layer (*i.e.*, a layer which is substantially not conductive to both electrons and holes) should be provided. As another example, for an electrode which will have a negative voltage applied, a p-type layer (*i.e.*, a layer which is substantially not conductive to electrons) should be provided. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a blocking layer below the control electrodes in the modified device of Iafrate *et al.*, in order to reduce leakage currents as taught by Schiebel *et al.*

10. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iafrate *et al.* (US 4,821,093) in view of Romero *et al.* (*IEEE Trans. Microwave Theory Tech.*, Vol. 44, no. 12, (December 1996), pp. 2279-2287), Esaki *et al.* (US 5,079,601), and Chapple-Sokol *et al.* (US 5,293,050).

In regard to claim **19**, Iafrate *et al.* disclose a method for fabricating a photo detect device, comprising the steps of:

(a) growing light absorption layers (column 7, lines 37-51), wherein said absorption layer are located at predetermined positions proximate to channels for carriers in the light absorption layers to be released from the light absorption layers in response to incident light and accumulated in the channels (column 7, lines 37-51);

(b) depositing at least two electrode on a contact layer to show horizontal conduction (column 3, lines 3-5), the two electrodes are formed at respective end portions of the at least one light absorption layer, wherein a photon absorption facilitates the current flow through the channel (column 7, lines 37-51);

(c) reducing the resistance between the electrodes and the contact layer (column 2, line 68 to column 3, line 2);

(d) etching the edge of the device to an extent necessary to reduce an electrical connection to other neighboring devices (column 6, lines 11-15); and

(e) depositing at least one control electrode (column 3, lines 5-9).

The HEMT photodector of Iafrate *et al.* lacks an explicit description that carriers are drawn to the channels from the contact layer. However, the photodectection

mechanisms of HEMT photodetectors are known in the art. For example, Romero *et al.* teach (last paragraph in the left column on pg. 2280; Fig. 2) that charge neutrality is reestablished by electrons drawn from the external circuit through the source contact. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the photodectection mechanisms of the HEMT photodector of Iafrate *et al.* include carriers being drawn to the channels from the contact layer in order to reestablish charge neutrality.

The method of Iafrate *et al.* also lacks forming quantum dots naturally in the course of growing the light absorption layers, controlling the amount of carriers provided to the quantum dots by adjusting the contact layer and/or a carrier supplying layer volume and the control electrode voltage, and depositing and etching an insulating film over the device. However, insulating films for integrated circuits (*e.g.*, FET) are well known in the art. That is, it would have been obvious to one having ordinary skill in the art to at the time of the invention provide an insulating film (*e.g.*, by depositing and etching) in the method of Iafrate *et al.*, in order for the device to function properly (*e.g.*, electrical isolation between different electrodes). In addition, Esaki *et al.* teach a light absorption layer comprising of nanostructures which produce reduced dimensionality electronic states (*e.g.*, quantum wells, quantum wires, quantum dots; column 8, lines 24-30) in order to have optical transition occurring between electron states in the conduction band (or hole states in the valence band; column 2, lines 35-39) so as to absorb light from the near to the far infrared (column 2, lines 26-29). That is, Esaki *et al.* teach that a photon (with energy $\hbar\omega$) is absorbed in the conduction band of

a light absorption layer when an electron in an electron state with energy E_1 makes an optical transition to an unoccupied electron state with energy E_2 ($E_2 = E_1 + \hbar\omega$). Esaki *et al.* also teach that electron state with energy E_1 must be populated with electrons in order for the optical transition to occur (*i.e.*, arrangement of the band and Fermi levels, for example by applying a bias voltage, so that electrons move from another layer into the electron state with energy E_1 of the absorption layer; column 6, lines 59-63). Thus, Esaki *et al.* teach that the absorption layer with electron state with energy E_1 should be populated with electrons and electron state with energy E_2 should be unoccupied so that an optical transition can occurred in order to detect light from the near to the far infrared. Further, Chapple-Sokol *et al.* teach it is known in the art that quantum dots are naturally forming the growth of a photodetector (column 3, lines 4-38) for any type of photodetector (column 6, lines 36-39). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide naturally formed quantum dots which are supplied with the appropriate amount of carriers by adjusting the carrier supplying layer volume and the control electrode voltage in the method of Iafrate *et al.*, in order to detect light from the near to the far infrared as taught by Esaki *et al.*

Response to Arguments

11. Applicant's arguments with respect to amended claims have been considered but are moot in view of the old ground(s) of rejection (see office action mailed 14 June 2005).

Conclusion

12. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SL

DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800